DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Project: Interactive Mirror

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1 OVERVIEW

The Interactive Mirror System (IMS) is an interactive device designed to replace your house hold bathroom mirror. In this document we will describe the installation and use of the Interactive Mirror System. The system is composed of two major sections: The Hardware and The Software. Though for the full experience it is recommended that the user should install and run using the full hardware:



FIGURE 1 - INSIDE OF THE IMS HARDWARE WITH MIRROR RAISED

The system is also capable on running on any Microsoft Windows system connected to a Microsoft Kinect. This document will discuss both installation of the completed hardware and the installation of just the software on a standard Windows machine.

2 INTERACTIVE MIRROR SYSTEM COMPLETE

The physical hardware of the complete Interactive Mirror System contains the following:

- A 32-inch LCD Monitor with 1080p resolution
- Microsoft Kinect for Windows
- A Intel i3 Processor
- Windows Embedded 8
- 8GBs of DDR2 Ram
- 32GB SSD Hard drive
- 6 USB 2.0 Ports 4 outside + 2 Inside
- 2 USB 3.0 Ports (Inside)
- Ethernet
- 802.11 Wireless
- Bluetooth 4.0
- Bluetooth keyboard and mouse combo
- One sided mirror
- Stained Wooden Enclosure
- FitBit Aria Wireless Scale
- FitBit One Health Sensor

3 SOFTWARE MINIMAL SYSTEM REQUIREMENTS

The system requirements for the software only installation:

- 1080p Monitor (Running 1080p)
- Microsoft Kinect for Windows
- 32bit (x86) or 64 bit (x64) Processor
- Dual Core 2.66-GHz or faster processor
- 2 GB RAM
- .NET Framework 4.0

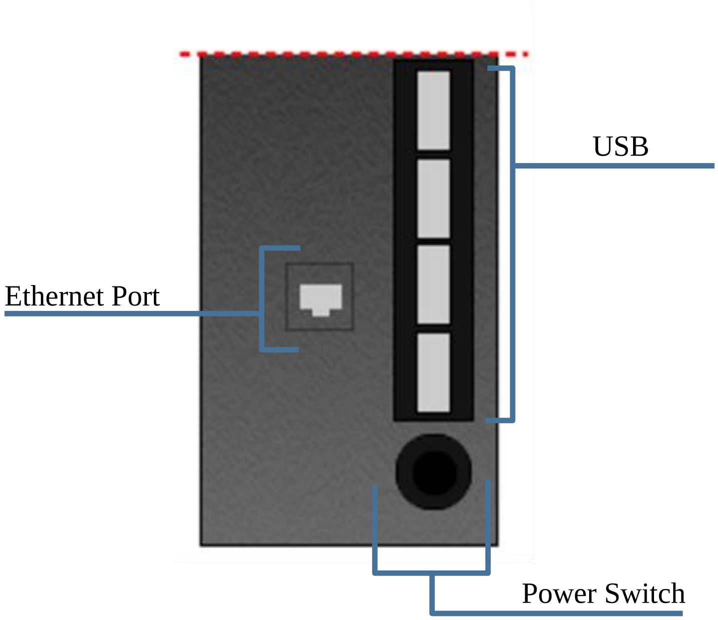
4 INTERACTIVE MIRROR SYSTEM COMPLETE INSTALLATION

Installation of the completed Interactive Mirror System is very simple due to the fact that it is a complete enclosed system including everything you need right in the box. All you have to do is mount it, either by placing it on a flat surface or on to a wall.



FIGURE 2- IMS EXTERNAL VIEW

Once mounted you just need to plug a power plug onto the right side of the system. Also if you choose to you can connect Ethernet, keyboard, mouse, and other USB devices onto the left side of the system.



To start the system you press the black button placed on the lower left side of the system. The system should run and start up in the IMS program. If not please click on the IMS icon.



5 SOFTWARE ONLY BASIC INSTALLATION

This section is for the installation of the software portion of the system. This could be to install updates to the IMS complete unit or to install the IMS software on a Windows machine (with Kinect). This is also for those who need to reinstall after needing to return the IMS Windows Embedded 8 to factory settings.

NOTE: For those using the complete IMS unit it is recommend that you have a physical keyboard and mouse connected for updates and installations.



First step is to connect and install the drivers for your Microsoft Kinect for Windows. Windows should search for and install the needed drives via Windows Update, but if not you can find them from the Kinect for Windows website: http://www.microsoft.com/en-us/kinectforwindows/

Once the Kinect is installed you need to be running at a 1080p resolution, then you click on the IMS Installation file:

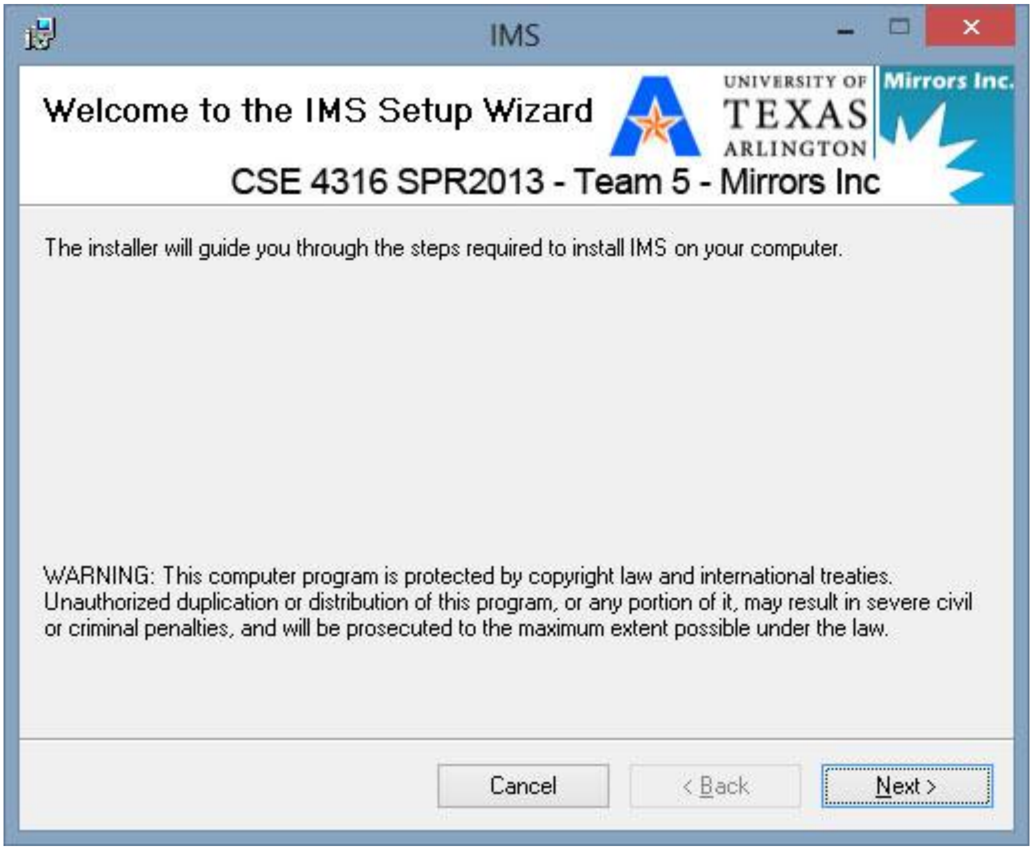


FIGURE 3- INSTALLATION FILE

Just follow the prompts on screen and the IMS will be install onto your system. If you receive a pop up about the installation file being an Unknown just click accept and continue with the installation. During installation IMS will check for .net Framework 4.0, if it does not check and you know you do not have .NET 4.0 please install it from the Microsoft's website: http://www.microsoft.com/en-us/download/details.aspx?id=17851

Once successfully installed you can then click on the IMS icon to run the program:



6 FIRST TIME USE – NEW USER REGISTRATION

NOTE: For first time usage and new user registration it is recommended that you have a physical keyboard and mouse connected to the computer. Though IMS can understand and dictate verbal commands it is much faster and easier with a keyboard and mouse.

For first time usage you will be presented with the IMS home screen. On the top left you should see an image being displayed from the Kinect. If you do not see this image, please double check with your Kinect Driver installation.



FIGURE 4- NEW USER REGISTRATION SCREEN

When the Kinect notices a person is in front of the system it will present the new user the New User Registration screen.

If you are not presented this screen, please either verbally say "SETTINGS" or use a mouse and click on the Settings icon (GEAR) on to top right:



From here you can click on New User Registration button and be presented with the New User Registration screen.

From here you can either choose to register by Logging in with Facebook (Recommended) or manually without Facebook.



It is recommended in order to use the full functionality that you register through Facebook. Once you hit Use Facebook and then choose to Login to Facebook you will be presented with a Facebook Login Screen:



FIGURE 5 - FACEBOOK LOGIN

Enter your Facebook information; know that IMS does not save this information anywhere. NOTE: DO NOT HAVE Keep me Logged In CHECKED!

Once you give IMS approval to use your information you are presented with this screen:



FIGURE 6 - FACEBOOK LOGGED IN

Double check that the information received from Facebook is correct. At the bottom you see TWO boxes for passwords. The one of the left is your typed password and is used to log in manually with a keyboard and mouse. The one on the right is used for verbal passwords. A Verbal Password is a simple spoken password you can use to log in to IMS with your voice. You must TYPE it there. Once done you click enter and you will be sent to the User Settings page.

7 SETTINGS PAGE

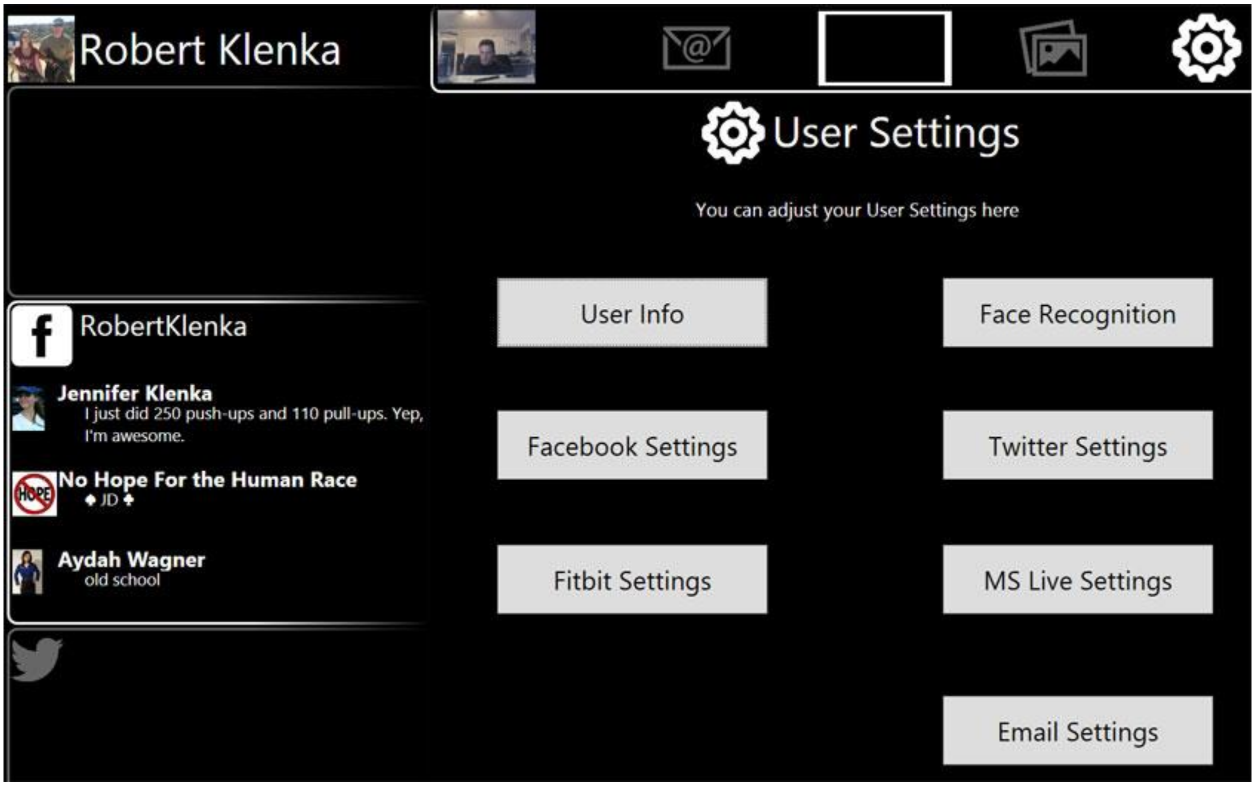


FIGURE 7- USER SETTINGS

User Settings allows you to sign into and edit different User Pages such as:

- User Information
- Face Recognition
- Facebook Settings
- Twitter Settings
- FitBit (Health) Settings
- MS Live (Calendar) Settings
- Email Settings

Let's start with the Face Recognition page.

8 FACE RECOGNITION

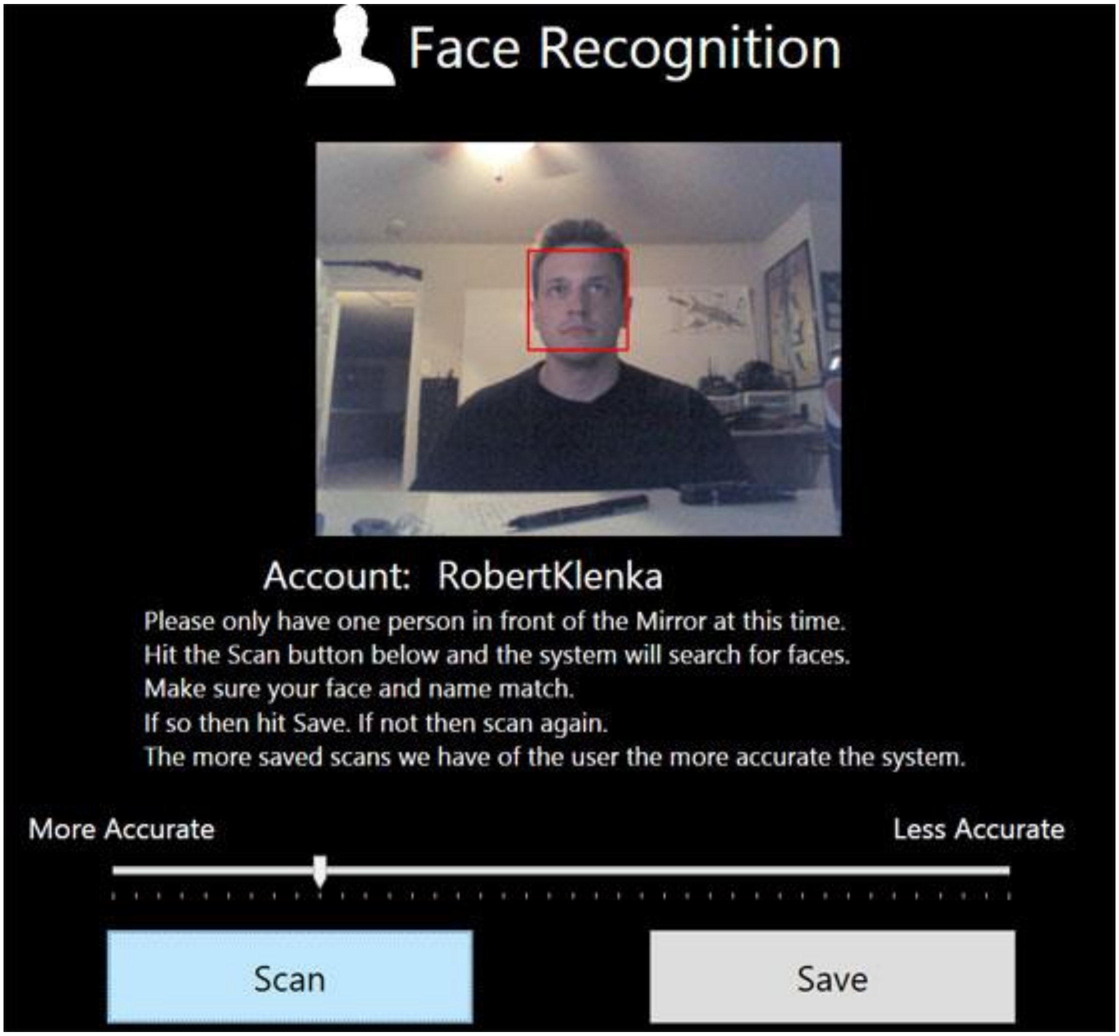


FIGURE 8- FACE RECOGNITION

Right as you enter the IMS does a scan for face. For this to work properly it is recommended that you have only one person within visual range at a time so we can make sure the right face goes to the right account.

The red square around the face shows that a face has been recognized. If one is not recognized then press the Scan button to rescan for faces.

Then you press save and it will save your face data to this account:

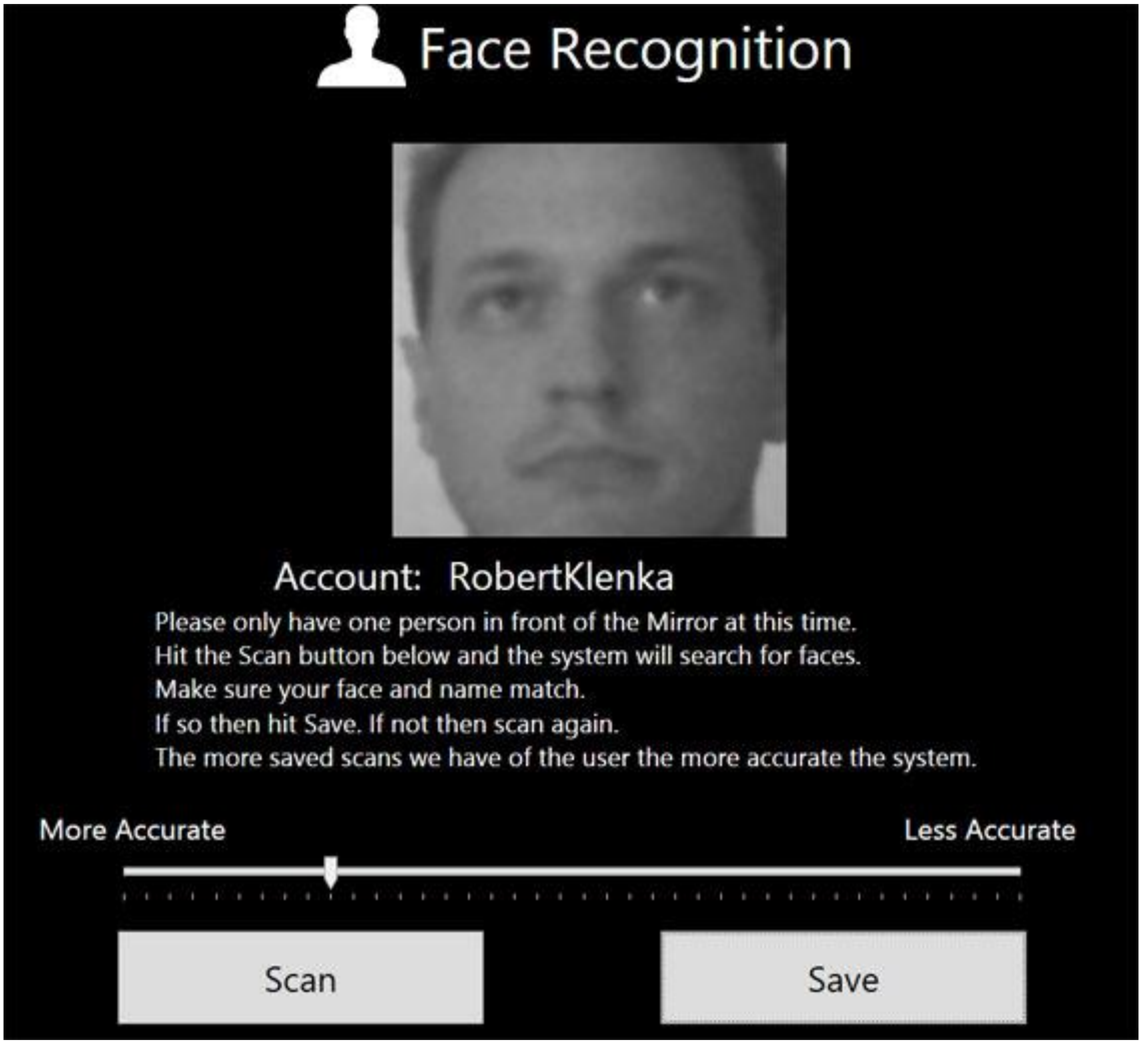


FIGURE 9 - FACE SAVED

The grey face is what is saved to the system. It is recommended that you then rescan so it can compare its data. You should then see a Green Text stating the account name above the red box. Usually if this is your first scan on the system it will register and display your name on any and every face it recognizes. This is obviously a safety issue so what you need to do is scan and save your face a few more times from a few different distances. The more faces you save the more accurate the data will be.

Also you can see there is a slide below that has a scale of accuracy. You can adjust this as needed to get the best accuracy. This will be more important as you start adding more and more users to the system. The more accurate you slide to the more strict the system will be and the more false negatives you will receive. The less accurate you make it the higher chance it will recognize someone as you who is not you.

9 LOGGING IN

There are a few ways of logging into the IMS, the main one is with the Face Recognition that you just set up for yourself. To log in with Face Recognition you pretty much just have to stand in front of the mirror. When the Kinect picks you up it will run a comparison between your face and its face database. If it finds a match it will log in. If the Kinect is having trouble noticing you can do Face log in by saying loudly “LOG IN”. If for some reason face recognition is not working you can log in using your Vocal Password you entered during registration. To log in vocally you first must say. “VOCAL LOG IN” the system then will ask you to speak your password; if successful you will be logged in. If even that does not work, you can log in manually using your keyboard and mouse in the Settings page.

10 TWITTER SETTINGS

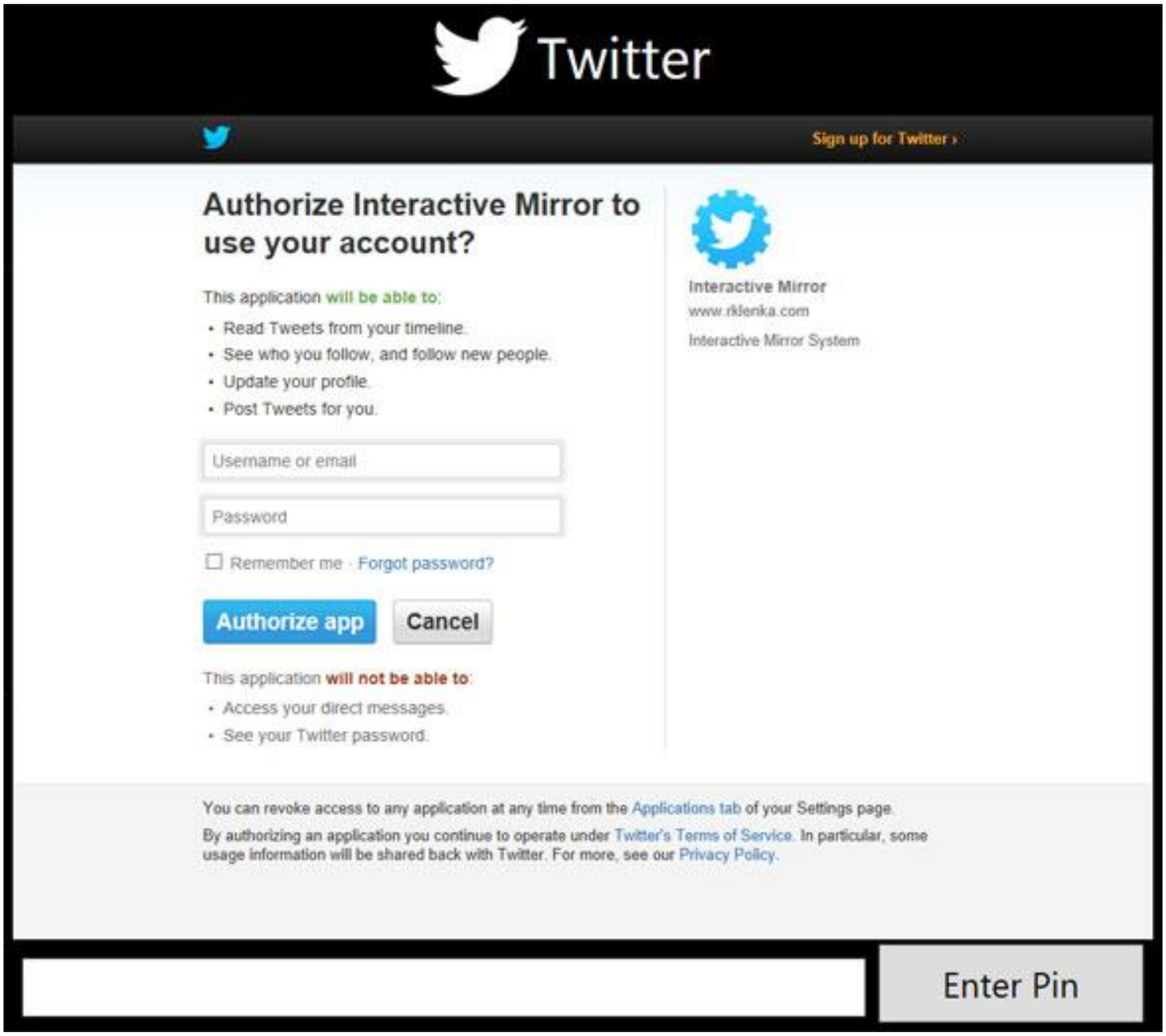


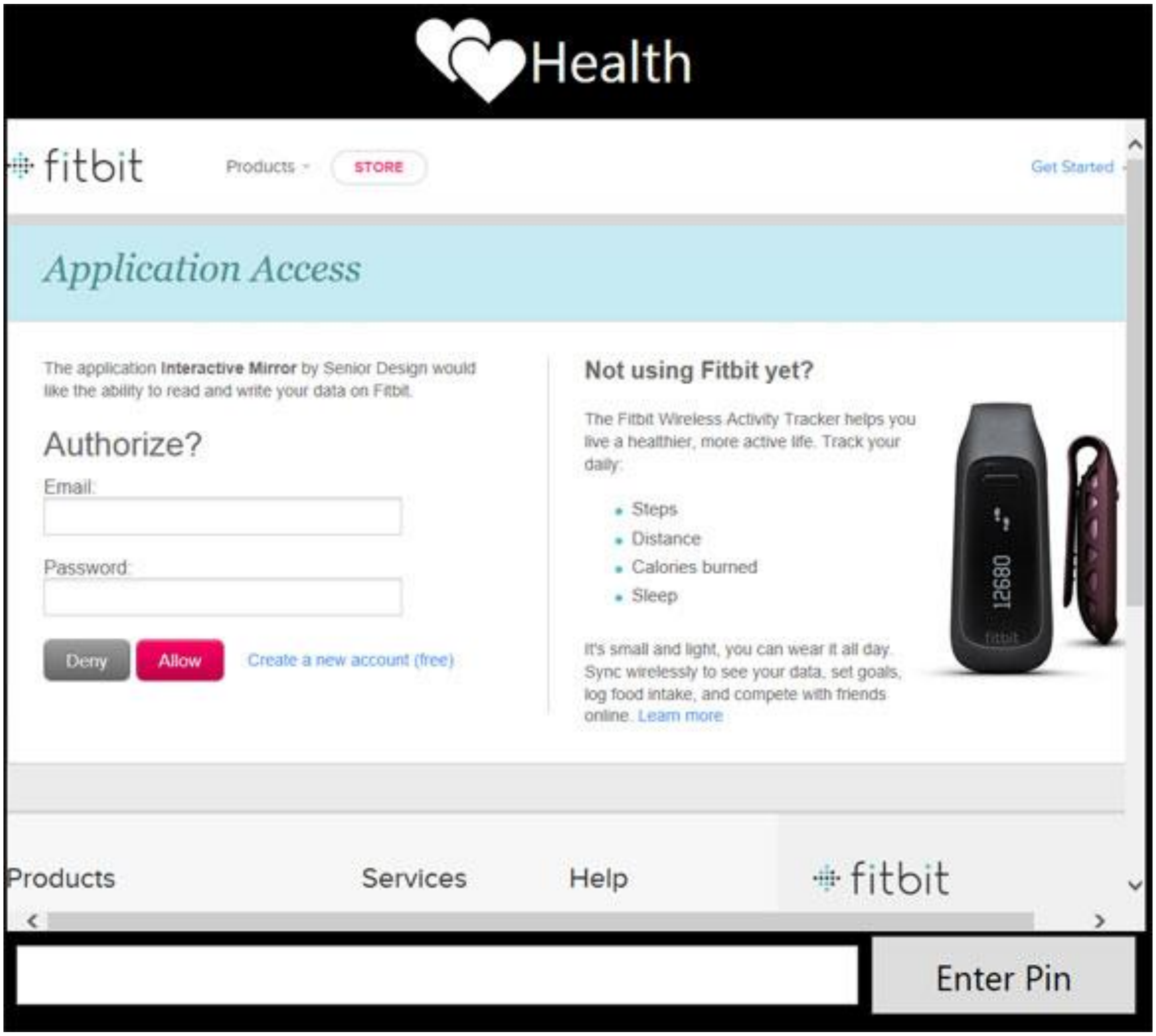
FIGURE 10 - TWITTER LOGIN

When you hit Twitter Settings, Twitter will then ask you to log in and give IMS access to your Twitter information. Just like with Facebook we do not save this log in information on the system.

Unlike Facebook, Twitter will then present you with a series of pin numbers that must me manually entered into the box on the bottom of the page. Once entered press Enter Pin and Twitter data will start displaying on the bottom left of your screen.

11 HEALTH SETTINGS

IMS uses FitBit to process and hold its Health data that it scans from the FitBit sensors.



Just like with Twitter once you hit "ALLOW", you must enter a Pin into the box and hit Enter Pin. Afterwards you will see Health data being displayed on the bottom right corner of the screen.

12 MICROSOFT LIVE SETTINGS

For Calendar we are using Microsoft Live so we can gain access to Microsoft Exchange data that a lot of people use. Just like with Twitter, Facebook, and FitBit you must allow IMS permission to your data.

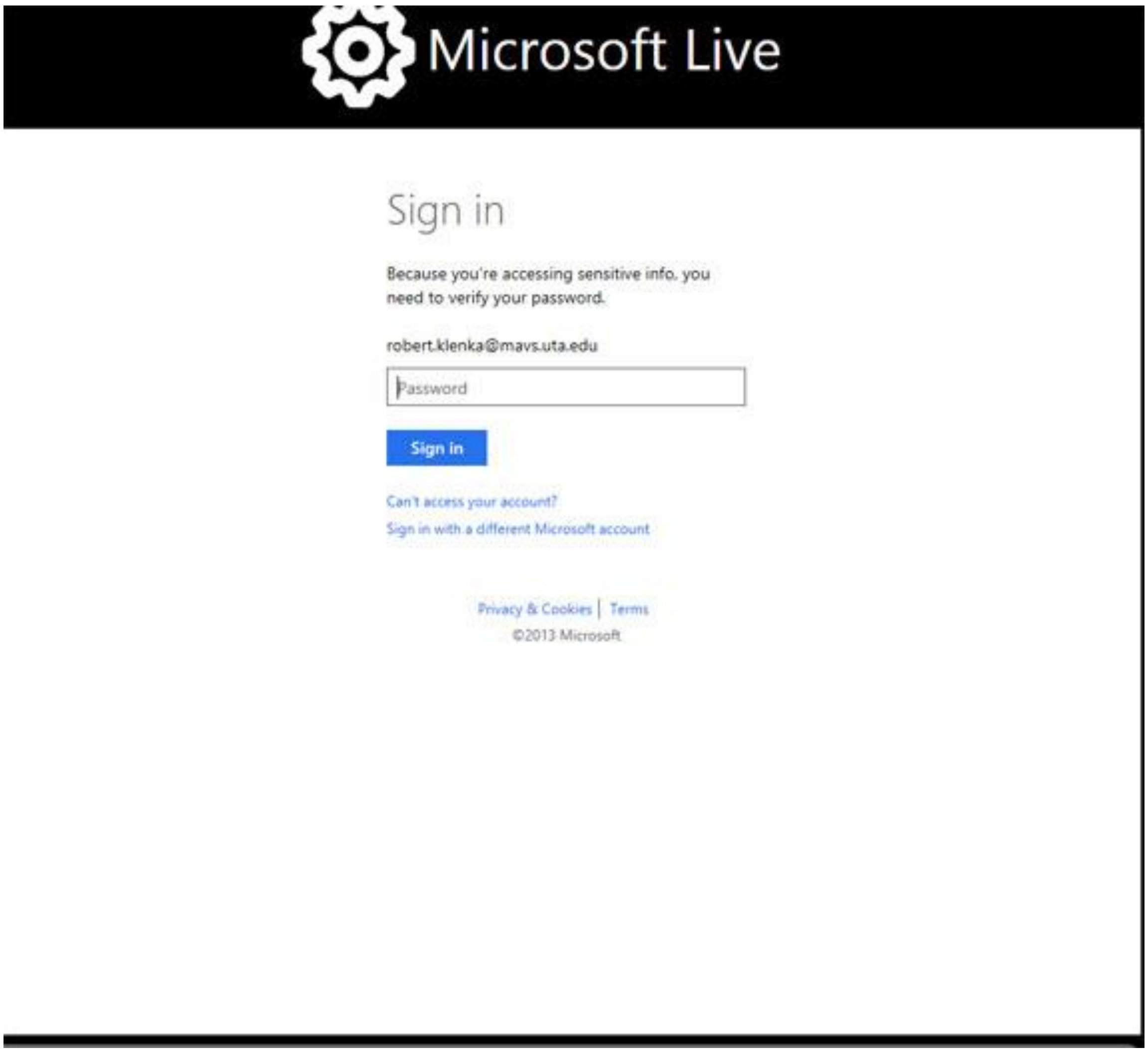


FIGURE 11- MICROSOFT LIVE

NOTE: Make sure you are logging into your own Live Account.

13 EMAIL SETTINGS



FIGURE 12 - EMAIL SETTINGS

Email is preset to use Outlook and Gmail servers, but if yours are different you can just enter it into the Server Address box. From there you enter your address and password (passwords are encrypted) . You then hit Test and Save and if IMS can successfully access your email you will be sent back to settings and the Email icon should be lit on the top center.

14 MUSIC AND PICTURES

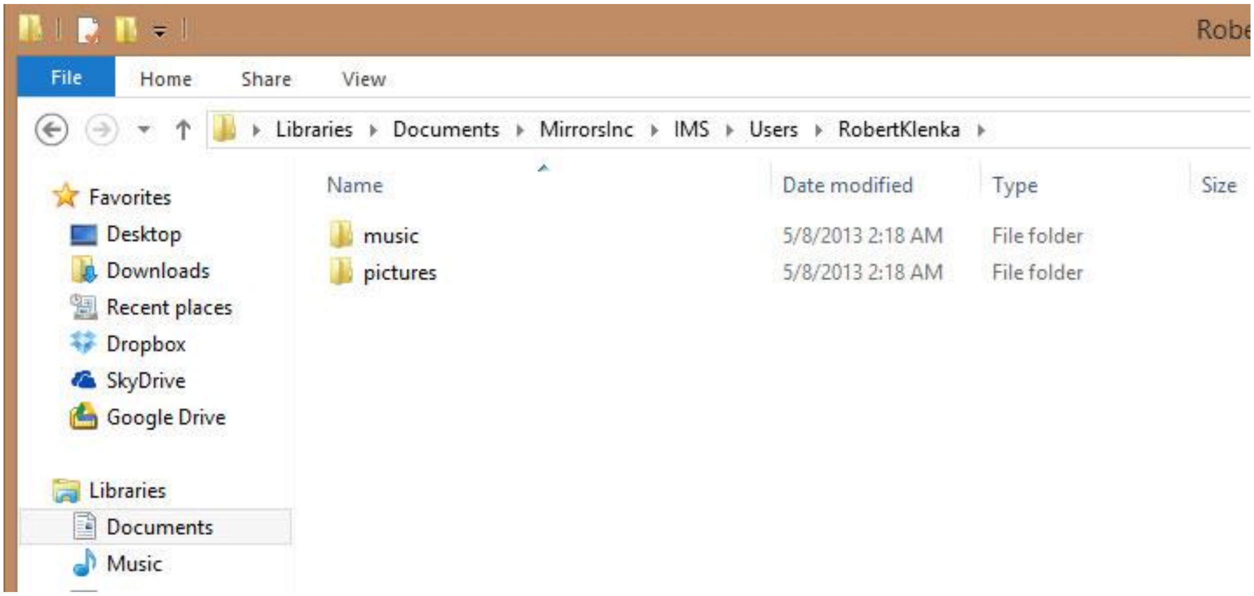


FIGURE 13- MY DOCUMENTS

To add images and pictures to IMS you need to go to your My Documents on your computer, then go to: MirrorInc/IMS/Users/USERNAME/ and you will see the music and pictures folders. Add them there and they will be added to IMS for usage.



FIGURE 14- MUSIC PLAYER

You can play loaded music by clicking on the associated buttons at the bottom of the display or pay saying “MUSIC”, “PLAY MUSIC”, “NEXT SONG”, “PREVOUSE SONG”.

15 INTERACTING WITH THE IMS

There are many ways to interact with the Interactive Mirror System such as:

- Wired Keyboard and Mouse
- Wireless multimedia Keyboard and Mouse
- Voice Commands
- Hand Gestures

15.1 KEYBOARD AND MOUSE

Keyboard and mouse is the easiest way to enter more complicated text such as usernames and passwords. We then tried to make that experience as pain free as possible. Im sure you have noticed that when your mouse gets close to an object it “snaps” to the center and hold for about a second. For small wireless keyboards and mouse this makes navigation much easier but on wired keyboards and mouse this can make navigation much more tiresome. To turn off the “Mouse Snap” you just say clearly: “MOUSE LOCK”. This will turn off (or reengage) this sapping feature.

15.2 VOICE COMMANDS

After the initial set up Voice Commands is the easiest way to interact with the IMS. Here are a list of voice commands you can say to the system:

- News – Displays current news
- Traffic, Map, – Displays current traffic conditions
- Weather – Displays the Weather forecast
- Calendar – Display the Calendar
- Facebook – Displays
- Twitter – Displays Twitter
- Health – Displays Health
- Settings – Displays Settings
- Email – Displays
- Images – Displays Images
- Music – Plays Music
- Next/Previous Song – Changes song
- Home – Takes you to the home (blank) page
- Log on – Logs you Into the System
- Verbal Log In – Allows you to log in using your verbal password
- Log Off – Logs you off
- Mouse – Turns on/off Hand Gesture Control
- Mouse Click, Go, Click – Simulates a Mouse Click

- Tab – Allows you to tab between forms
- Enter, Return – Works just like clicking the button
- Space – Inputs a space
- Delete – Deletes a character
- Mouse Lock – Enables/Disables the mouse “Snap” feature
- Aperture – For fans of the game “Portal”

15.3 HAND CONTROL

You can also use your hand to control input into the IMS, to enable you say: “MOUSE”. A green text that says “MOUSE” will appear in the top left. When lit you can place your hand in front of your body and control the mouse cursor by moving your hand. You then can say “CLICK” or “GO” to click on a object. Having Mouse Snap enabled will help.

15.4 VOICE DICTATION

IMS also comes with a Speech to Text feature. To enable you say “VOICE” and a green text that says “VOICE” will appear in the top right. This will allow anything you say to be converted to text. This is very useful for Social Media posts.

16 DISPLAY INTERFACE

16.1

Now that you are logged into everything lets fully explain the interface.

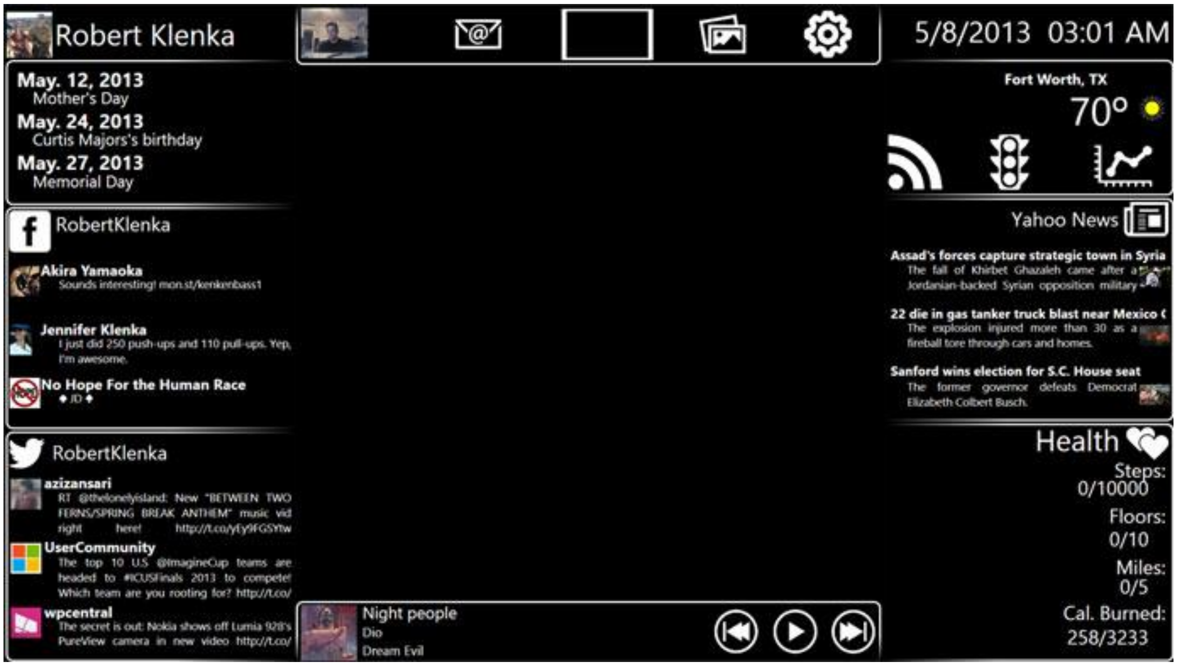


FIGURE 15 - DISPLAY INTERFACE

You can access each of the following through Voice Commands by stating the sections name, keyboard and mouse by clicking on each section, or using hand gestures.

Here are the sections starting from the top center and moving clockwise:

- Home Square (The white box top center)
- Pictures
- Settings
- Time and Date
- Weather
- Traffic/Maps
- Stocks
- Yahoo News
- Health
- Music
- Twitter
- Facebook
- Calendar
- Email

16.2 WEATHER

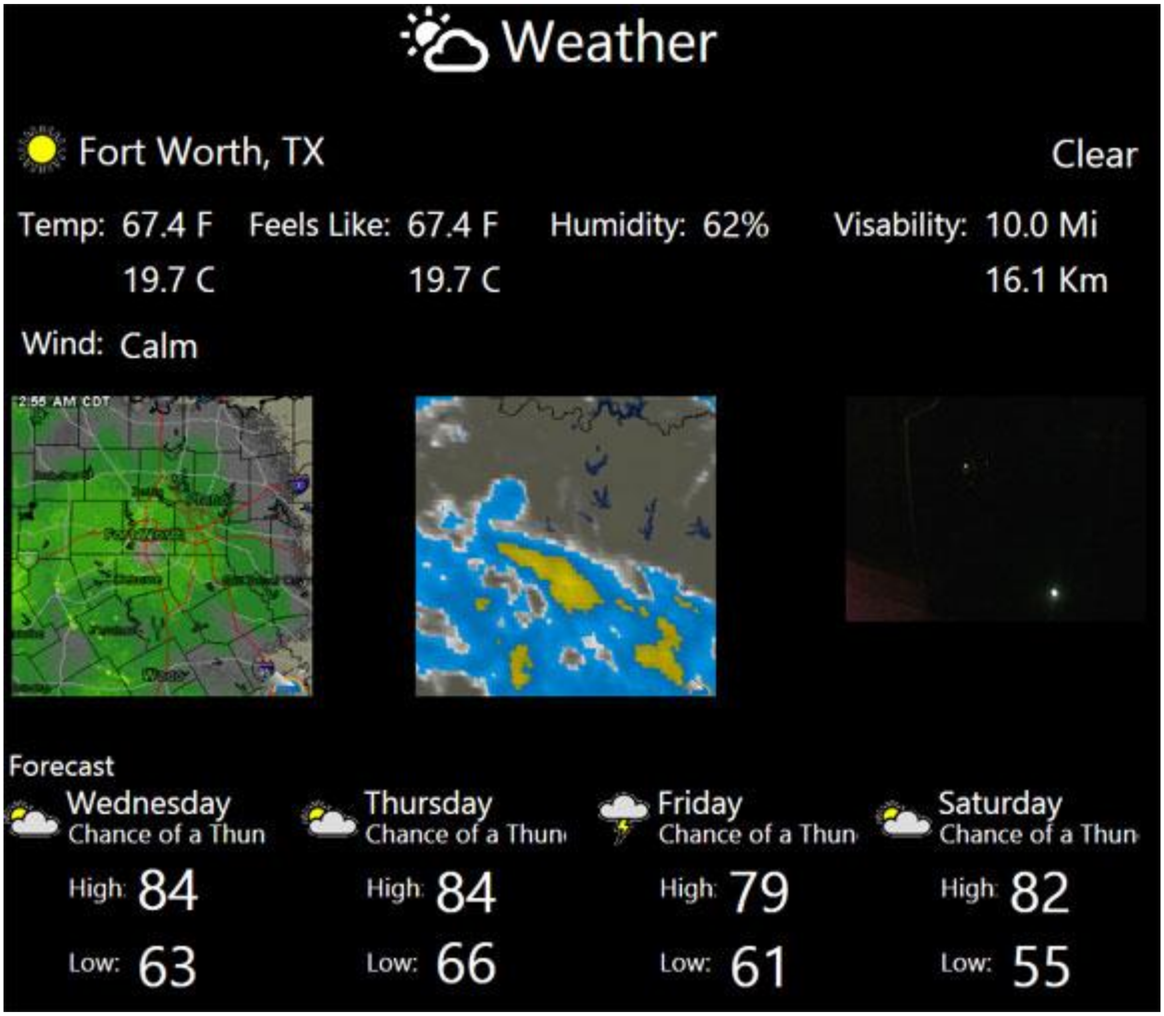
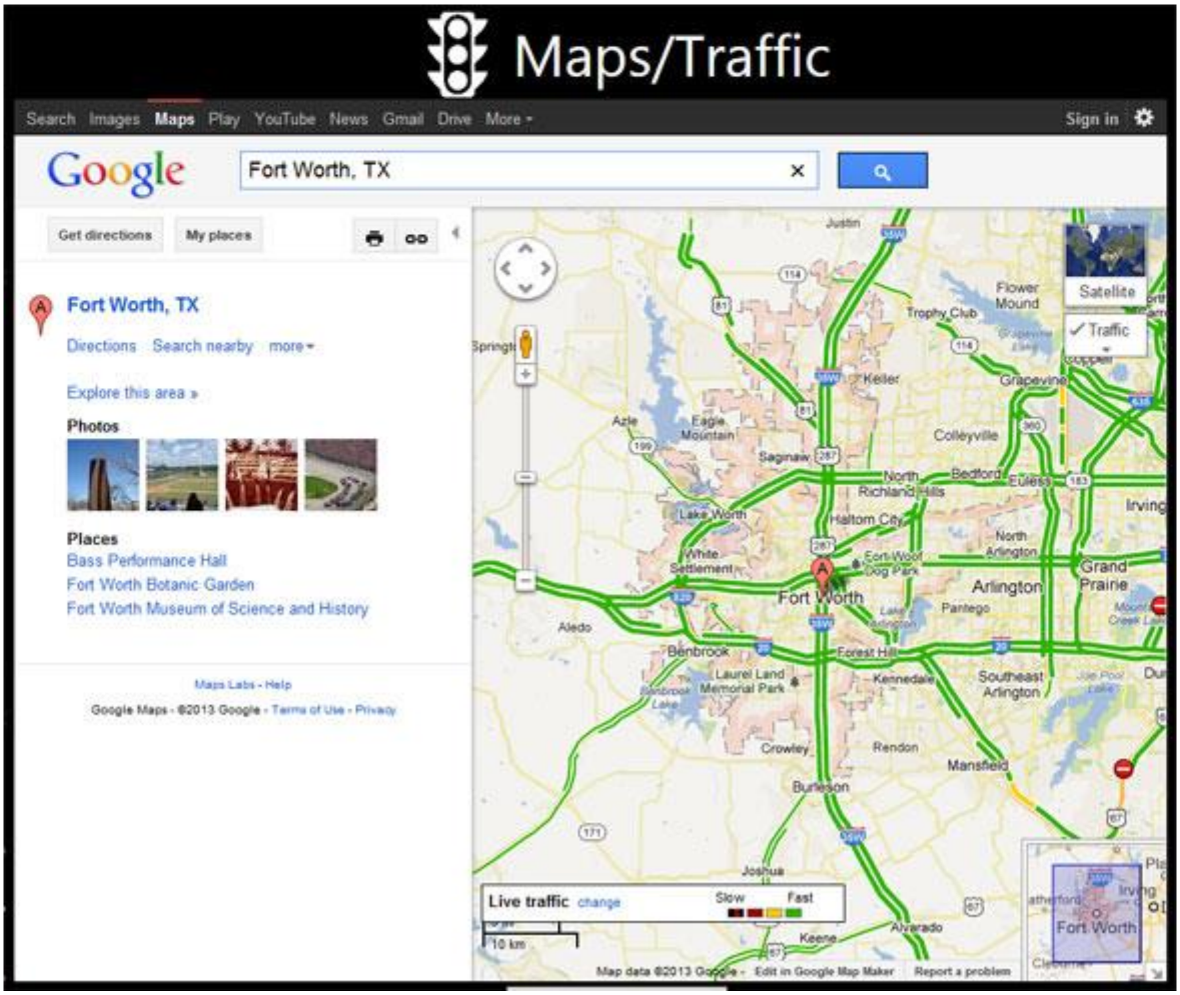


FIGURE 16 - WEATHER

You can access Weather simply by saying "Weather" or you can click on its section at the top right. Here you can see todays and the next 4 days weather forecasts.

16.3 MAPS/ TRAFFIC



You can access maps by saying “Maps” or by clicking on the Traffic icon. Maps uses your current ip location to display the local traffic conditions.

16.4 NEWS



FIGURE 17- NEWS

You can access News by saying “News” or by clicking on its section to the middle right. Once opened you can view a more detailed view of the story by clicking on its title:



16.5 HEALTH



FIGURE 18 - HEALTH

You can access health by saying “Health” or clicking on its section on the lower right. From here you can see your day’s fitness goals and information. The picture above was taken late at night (or really early) so must of the data has reset for the day.

16.6 TWITTER

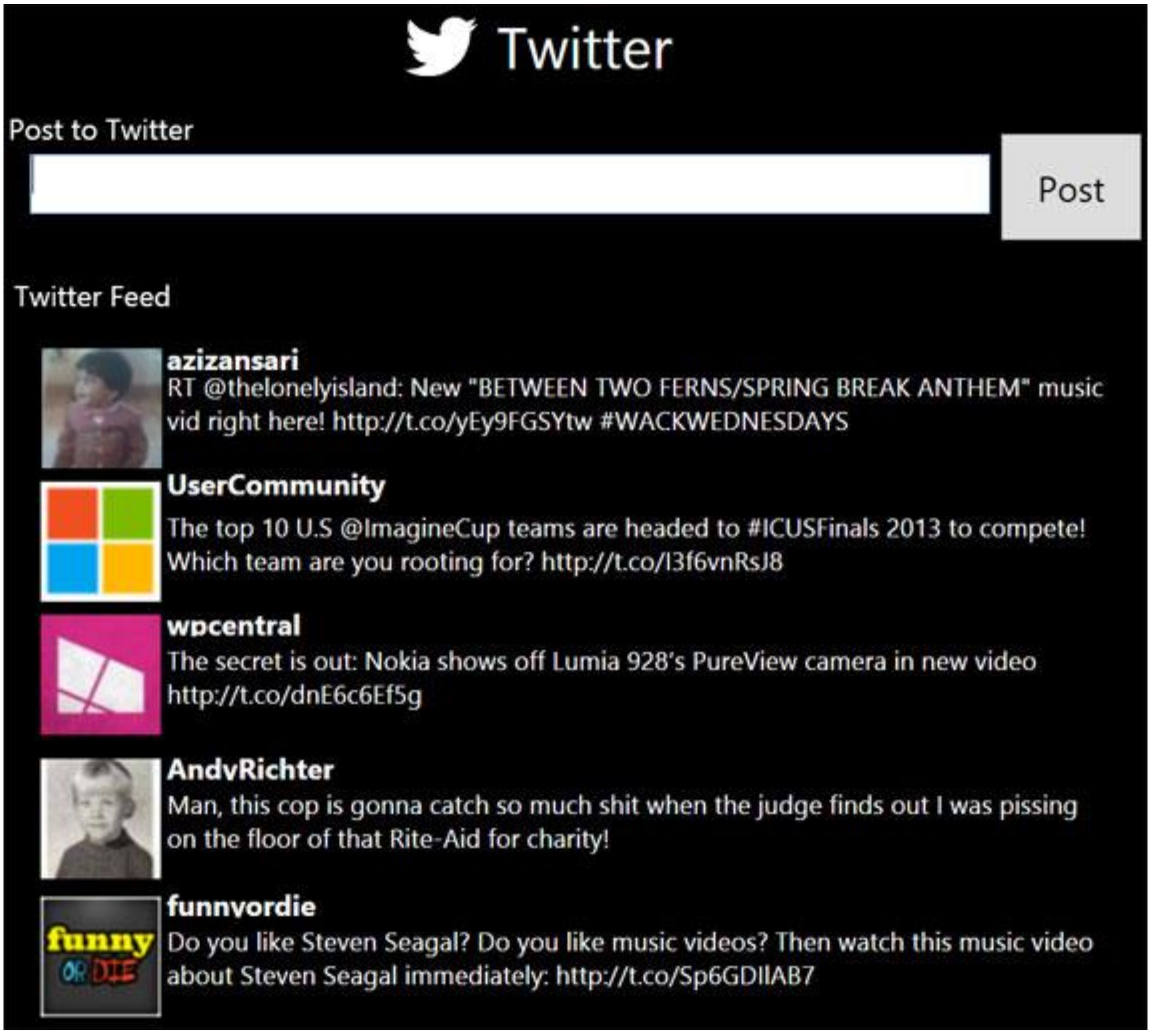


FIGURE 19- TWITTER

Like with the others you can access it by saying “Twitter” or by clicking on it at the bottom left corner. From here you can view your latest Twitter updates and can post your own by using a keyboard or speech dictation.

16.7 FACEBOOK

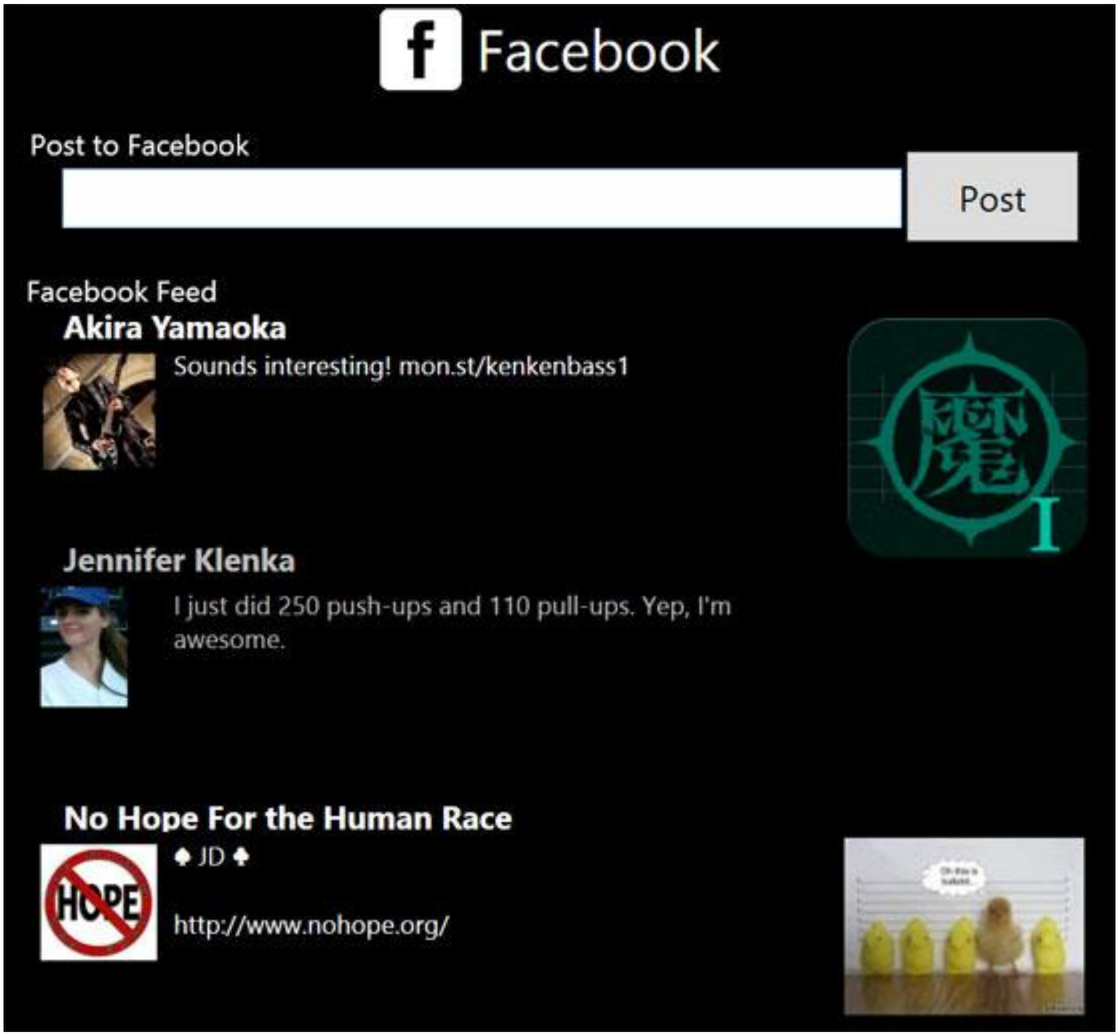


FIGURE 20- FACEBOOK

Like with twitter you can view the latest Facebook posts and even post your own.

16.8 EMAIL

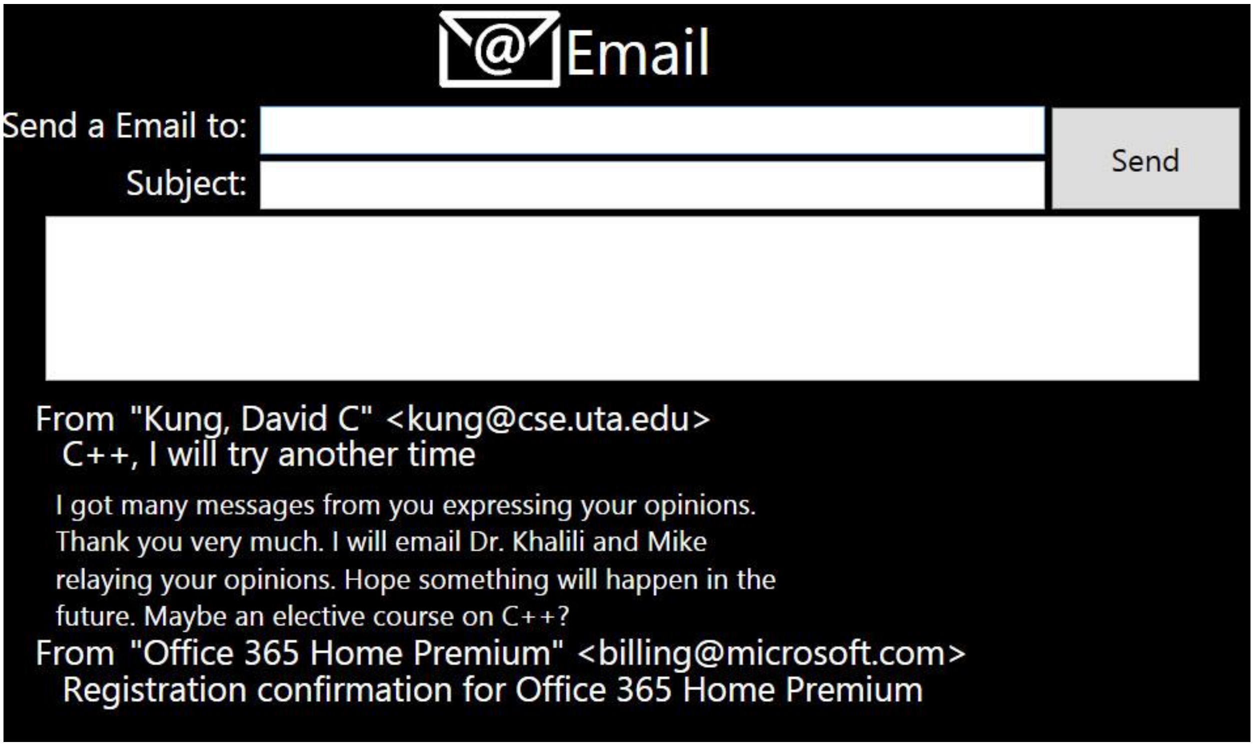


FIGURE 21 - EMAIL

Using the email you can view and even reply to the last few emails that have been sent. You can access them by saying "Email" or by clicking on the email icon.

17 TROUBLE SHOOTING

17.1 HARDWARE

The hardware for the Interactive Mirror System was designed to be easily accessed and changed using off the shelf components.

17.2 MAJOR HARDWARE FAILURE

Any major hardware failures can be replaced by similar off the shelf replacement parts.

17.3 THE IMS WILL NOT START

In the event of the IMS not starting up, try the following solutions

- Double check that the IMS is plugged in
- Restart the IMS system
- Call a repair technician

17.4 THE IMS HAS OVERHEATED

In the event of the IMS overheating, try the following:

- Make sure that the fans are not blocked. If they are, reposition the IMS so that they are unblocked.
- Clean the dust from the fans. DO NOT ATTEMPT WHILE THE IMS IS RUNNING.
- Exit the system
- Turn off the system with the power button. It can be found on the left panel of the enclosure.
- Unplug the system. (optional)
- Wait for a few minutes before starting the system up again

17.5 SOFTWARE

17.5.1 NO VIDEO BEING DISPLAYED IN CORNER

Make sure the Kinect was correctly installed and working

17.5.2 HAVING TROUBLE RECOGNIZING MY FACE

Make sure you have sufficient lighting or try adjusting the accuracy slider.

17.5.3 UNABLE TO HEAR VOCAL COMMANDS

Make sure you are in a quiet location with out to much extra noise.

18 WARNINGS / HAZARDS

18.1 FANS

Blocked fans can lead to the IMS overheating. Make sure to position the IMS in an appropriate location.

18.2 EXPOSED PORTS

The IMS has USB and Ethernet hubs on the left panel of the enclosure. To reduce risk of electrical shock, or harming the system, keep these ports dry and away from water. If the ports have been exposed to water, immediately turn off the system. Do not attempt to use the system until thoroughly dry. If there is a risk for electrical shock, do not use the system until a technician has replaced or thoroughly cleaned the parts.